WIRELESS
FIELD TESTS
A National Science Foundation
Project by Old Colorado City
Communications

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of Allocation of Spectrum in the 5 GHz Band to Establish a Wireless Component of the National Information Infrastructure	)	RM No. 8653 ET Docket No. 96-102
In the Matter of Petition for Rulemaking to Allocate the 5.1 - 5.35 GHz Band and Adopt Service Rules for a Shared Unlicensed Personal Radio Network	)	RM No. 8648

Dave Hughes
Principal Investigator
dave@oldcolo.com

Dewayne Hendricks
CO-PI
dewayne@warpspeed.com

Robert Buaas
CO-PI
buaas@wireless.net

Dr. George Johnston
CO-PI
gji@zone.ultranet.com

L.S. Fox
Administrator
larry@oldcolo.com

RESPONSE TO THE FCC INITIAL REGULATORY FLEXIBILITY ANALYSIS CONTAINED IN APPENDIX B OF THE NPRM

The entire substantive analysis by the FCC contained in Appendix B of the NPRM under this legal requirement is quoted below:

"D. Description, Potential Impact, and Number of Small Entities Affected: This proposal may provide new opportunities for radio manufacturers and suppliers of radio equipment which may be small businesses, to develop and sell new equipment. We are unable to quantify other potential effects on small entities. We invite specific comments on this point by interested parties."

"G. Significant Alternatives: If promulgated this proposal will provide additional unlicenced spectrum. We are unaware of other alternatives which could provide sufficient spectrum in the immediate future. We solicit comment on this point."

As the Principal Investigator of a series of field tests of wireless data communications for education, with emphasis on the examination of the value of shared no-license Part 15 devices, I file these comments on behalf of the technical staff of this project, which represent no commercial manufacturer or service, nor government agency, (and not the NSF itself) but only the considered judgements of independent investigators evaluating wireless data communications in the context of the broadest public policy interests. This project's status, progress, and findings can be accessed at http://wireless.oldcolo.com

028

2502 West Colorado Ave., Suite 203 • Colorado Springs, CO 80904 • Voice 719 636 2040 • Fax 719 528 5869
Wireless Web <http://192.160.122.3/>

We do not disagree with the mild speculations that this proposal 'may' provide new opportunities for small business manufacturers and suppliers of radio equipment.

In our studies of wireless for education, we have encountered scores of small businesses, would-be business persons taking community or junior college courses helping them learn how to use 'The Internet' in their business, and community leaders of small towns who see the potential of bi-directional connectivity to the Internet being key to their economic survival.

We strongly disagree that the only 'small entitites' affected by the outcome of this proposal 'may' be small radio suppliers.

Very large numbers (to the 5 million range) of existing or potential very small businesses of all type - from self-employed, work at home individuals offering products or services over the Internet, through small businesses occupying commercial office, retail or manufacturing space, can be either positively or negatively affected by their ability to employ longer range (1 to 15km or more) shared spectrum no-licence wireless as an alternative to more costly (recurrring charges) wired connectivity to the nearest points of presence.

General public reports on US Web Sites alone, ranging from estimates of 200,000 or more, repeatedly report on sites set up in people's homes, home-offices, and small businesses. These operate, bi-directionally for the purposes of small business or individual professionals marketting, online publishing, online catalog sales, and provision of other services. Not to be overlooked is also the provision of local small scale ISP services in small towns, suburban neighborhoods, where low cost continuous 24 hour connectivity to the Internet is essential 'by' the ISP, as well as the potential for such ISPs to provide higher (than 28.8 telephone modem) connectivity links to themselves from customers.

In fact the most economically revolutionary impact of the combination of the availability of low cost, multi-user, multi-tasking microcomputers costing from $3,000 to $7,500 (NT, OS2, Win95, Linux, MacOS Webstar systems), with 56kbs or above, TCP/IP connectivity to the Internet through some local larger ISP, can be felt in small business. The proportion of the total monthly cost attributed to the 'local loop' charges for dedicated data services can range from 20 to 40% of the total cost of connectivity. No-licence shared spectrum wireless connections between the premises of such small business, and the local Internet Point of Presence, where the only cost is that of radios, such as those currently in the 902-928 MHz and 2.5 GHz bands - from $1,250 for FreeWave 115kbs (serial line) radios that can operate up to 20 miles, to $7,500 Solectek 2Mmps radios that are rated at 25 miles - could be merely the forerunners of whole new classes of radios with much greater processing gain, much lower potential for interference, mass

produced (where, because of the current restrictive FCC rules for such radios has not spawned a large industry) yet still extremely valuable for the 'last mile' of small business connectivity.

What seems constantly to be overlooked in predicting impacts on US Society of connectivity - and this FCC staff analyses entirely overlooks - is that, because of the microcomputer and Internet revolutions, Americans are no longer just passive 'consumers' of communications services. They are also becoming innovative, entrepenurial, small scale 'producers' from non-traditional locations. It is wholly possible today for an individual to net from $30,000 or more annually operating entirely from one's home, with less than $10,000 capital expenditures, so long as continuing connectivity costs are low enough. Never before in modern US economic history has this been possible. And with the growth of small business employment - far exceeding the total of all large business growth in labor over the past 20 years, accelerating large business downsizing, this trend of small, self employment, and creation of 'information and communications' dependent businesses will grow massively. The total costs of connectivity, therefore are crucial determinents of the lowest 'threshold' of access by small business to global nets and markets. A 25% lower cost of such connectivity by use of no-licence, high data rate, secure and reliable wireless, can make a big difference.

A simple comparative model, the very first level above a 28.8 modem based business, is shown below. Typical Colorado Springs prices.

Linux, NT, OS2 Web Server requiring 56kbs IP service	RBOC	Wireless
DSU/CSU Router	$1,500	
Part 15 Radio		$1,250
Monthly local loop charges	100	0
Monthly charges at POP	300	300
First 5 Year Cost	$25,500	$19,250

T-1 level service (typical Colorado Springs prices for business)

NT, Linus, OS2, Mac or Sun Server		
DSU/CSU Router	$2,500	2,500
Part 15 2Mbps Radio		7,500
Monthly local loop charges	650	0
Monthly POP charges	1,500	1,500
First 5 year cost	$131,500	$100,000

The difference of $31,500 or approximately $6,000 a year for very small businesses is substantial. In rural areas, the monthly

RBOC charges for a T-1 local loop connection 25 miles would be closer to $1,000 a month than $650, which is a quoted urban US West charge. Or $60,000 over 5 years. A very substantial first 5 year (the crucial startup years for small business) cost.

Unless the aim of public FCC policy is to favor only larger commercial wireless service (auctioned services), or wired (telephone or cable) companies, then the provision of longer range, no-licence wireless radios, can have direct bottom-line effects of significant magnitude on hundreds of thousands of existing small businesses and help spawn millions of new US small businesses of all types. And would be, not so incidentally, very pro-competitive, as (1) between wireless and wired services, and (2) between radio manufacturers all of whom can compete in the shared spectrum space.

David R Hughes
Principal Investigator
NSF Wireless Field Test Project
NCR-9527664
July 13th, 1996